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in the International Exposition at St. Louis, 1904, I have had a plaque prepared which forms a lasting memento of the cordial and pleasant relations which prevailed there. I take the liberty of forwarding for your acceptance a specimen with your name engraved on it." The plaque is inscribed on one side "Simon Newcomb, *Arta Artis Vincula*" and in small letters "Peter Breuer," and on the other side: "Zur Erinnerung an Deutschlands Beteiligung an der Weltausstellung in St. Louis, MCMIV." See also 1903-04.

1907, Jan. 5: Made *Commandeur de l'Ordre National de la Légion d'Honneur*, France. A bill granting permission to accept this decoration was deemed unnecessary in view of the permission already given to accept the rank of Officer of the *Légion d'Honneur*.

1907, Feb. 8: Elected one of the 12 Honorary Fellows of the Physical Society, London.

1907, March 22: Elected a Foreign Member of the mathematics-natural science class of the *Videnskabs Selskabet* (Society of Sciences), *Christiania*. (Number limited to 100.)

1907, June 3: Elected Honorary Member of the *Société Scientifique* "Antonio Alzate," Mexico.

1907, July: Lecturer at the Summer School of the University of California.

1907, July 20: Elected Foreign Member of the *Königliche Gesellschaft der Wissenschaften*, *Göttingen*. Election royally confirmed Oct. 4. See also 1888.

1908, April 6-11: One of the 11 Vice-presidents and one of the 9 principal speakers of the Fourth International Congress of Mathematicians held at Rome, Italy. He was the only American on the International Committee (61 members) for organization of the Congress. He was also a Delegate from the Smithsonian Institution and the American Philosophical Society. See also 1879.

1908, Aug.: Delegate from the National Geographic Society at Washington to the International Congress of Geography at Geneva, Switzerland.

1908, Aug. 17: Received in audience by Emperor William II. at *Wilhelmshöhe*, Germany, and lunched with his Majesty and the Empress.

1908, Nov. 13: Appointed one of the Committee of 19 on the "Charles William Eliot Fund."

1908, Dec. 19: Elected President of the Philosophical Society of Washington. See also 1871.

1909, Jan. 1: Elected Vice-president of the American Philosophical Society, Philadelphia, Pa. See also 1878.

1910, July: At this time the two bronze doors for the West Entrance of the U. S. Capitol, designed and modeled by Professor Louis Amateis, of Washington, were cast in New York. In the Science panel of one of the doors is a medallion of Newcomb. At present the doors are in the north vestibule of the National Museum, new building.

Died at Washington, D. C., July 11, 1909

R. C. ARCHIBALD

THE BIOLOGY OF THE MALAYAN ISLANDS¹

THERE are not many biologists who have not read with absorbing interest, the account by Wallace of his experiences in the Malayan countries, and his conclusions therefrom. Likewise, there are but few biologists unfamiliar with the story of Beccari's experiences in Borneo, or with the account of d'Albertis's expedition to the Fly River. Probably no similar area of land surface has ever yielded, on superficial examination, such a wealth of unique living organisms and striking biological problems. We have reason to know that all of the early work in these regions has been in the nature of pioneer reconnaissance—the breaking of trails—and that the field as a whole is to-day as near a virgin field as any remaining on earth.

It is doubtful if the geography of any other similarly extensive region of earth is so unfamiliar to Americans as that of the Malay Peninsula Region, and the Malay Archipelago. When we speak of the Sunda Group, the Moluccas, or even the large and important Islands of Celebes, Gilolo, Ceram, or Bouru, Americans commonly have but dim idea of their location. And how many Americans know the difference between Macassar and Malacca, or Sulu and Sula? Yet this whole region, including the Philippines, extends from 2 degrees north to 10 degrees south, for a distance of some 2,300 miles, and more than 2,000 miles from east to west. Its northernmost limit falls in the latitude of Mexico City, Santiago de Cuba and Bombay. Its southernmost limit falls in the latitude of Central

¹ Letter addressed to Dr. David Starr Jordan.

Peru and the northern extension of Australia. Some of its most important islands and groups represent very large extents of land surface. Indeed, the whole region, taken together, is considerably more than a fourth of the entire area of the United States. Sumatra is larger than Kansas and Nebraska together by some 20,000 square miles. Borneo is about as large as California and the New England states together. Celebes is twice the size of Illinois. Ceram is larger than the entire Hawaiian group taken together. The magnificent Island of New Guinea is larger than Texas and Louisiana together, and vastly more varied in topography and conditions than either of these states. The great Philippine group of above a thousand islands, comprises a land area of more than 127,000 square miles, scattered through 15 degrees of latitude.

A large part of this entire area is covered with dense tropical forests, but there are also considerable areas of mangrove swamps, upland meadows, and partially arid districts, the whole threaded with numerous streams and with occasional lakes. As a general thing, these countries are very mountainous, many of the mountains reaching into high altitudes, and carrying faunæ and floræ of extraordinary interest. In New Guinea some of the mountains are snow-capped. Extensive evidences of volcanic action, both ancient and recent, are commonly visible, though extensive outcrops of metamorphic rocks occur in most of the groups.

Many of the most interesting of the islands of this region are, biologically speaking, practically *terræ incognitæ*, having been touched, if at all, only at isolated points, by travelers or expeditions. It is a common experience in the Philippines—even after fifteen years of American occupation—to find important groups of living organisms richly represented, which have never been previously recorded as existing here at all. It is not difficult to enter the more extensive forests at almost any point and stumble upon magnificent forest trees that are wholly unknown to science. The more inconspicuous groups among plants, as for instance the fungi, have been scarcely

touched, though, so far as they have been examined, they show a remarkable proportion of new and unique forms. In many groups of insects of the greatest biological and economic importance, we find here a vast fauna, most of the species of which are yet unknown to science. For instance, so far as known to me, only two species of Aphididæ have ever been recorded from the Philippines, and only two species of Thysanoptera, whereas we possess an astonishing display in these two groups. During my first year at Los Baños, I brought together at this one point a far greater number of species of the important family Ichneumonidæ than had previously been described from the entire Malayan region, including Java, Sumatra, the Peninsula, and New Guinea. In three years, at this one point, I have also far exceeded in many universally distributed groups, the number of species reported for entire British India. In certain groups with which I am specially familiar, it is very evident that a knowledge of the Malayan fauna will completely modify our ideas of the comparative anatomy and taxonomy of these groups for the world.

To illustrate what might be very rapidly accomplished here, I may say that during three years, with but scant time myself for field work, but by the use of a Cuban boy whom I have trained for this work through eleven years, and a few Filipino students, I have been enabled to get together very extensive collections of fungi in this locality, which have been occupying a large amount of attention from half a dozen of the world's best mycologists, producing a succession of papers of the highest importance, and making known to science a very large number of remarkable fungus types, including the causative organisms of a very considerable number of important plant diseases. Similarly, these activities—mostly in this immediate locality—in connection with the insects, have produced a mass of valuable materials that is now occupying a large part of the time of above thirty well-known entomological specialists throughout the world. This has been done wholly extra-officially, and at my own personal ex-

pense. If this be possible in so short a time with practically no outside support, what splendid things might not be possible with a little organization and support. After wide experience, running through twenty-four years, I do not, as a general thing, believe in expeditions. The results to be obtained therefrom rarely justify the great expense, and do not compare either in quantity or quality with residence. In these countries we have had resident biologists only in Singapore, Java, Amboina, Sarawak and Luzon—that is, biologists engaged on the fauna and flora. Among other things, continued residence would enable us to make more extensive collections of seeds and living plants than have ever been made in these regions before, and American botanic gardens and American botanists could profit largely through such activities. Recently a single Sunday jaunt made near here produced a fine new *Gardenia*, a new *Pavetta*, several recently described palms, some new Hepaticæ and mosses, and a large number of new fungi.

It seems to me that this is a tremendous opportunity for American institutions or for American scientific societies. I believe that funds for work of this character could be expended here with more highly interesting and important results in proportion to the amount expended, than in almost any of the lesser known regions of the earth. I recommend most strongly that this be accomplished through *residence*, in periods of not less than two or three years for any given region. This would involve something of the nature of a moving laboratory. Good houses can be built very cheaply in these countries, and temporary locations can be obtained with great readiness, and without expense, at almost any point. There are a number of men, including myself, who are ready and anxious to take part in this work, and to whom salary or separation from home and the larger centers are entirely minor considerations. The station or stations maintained would ever be ready as headquarters for students who were engaged in advanced investigations and who might come out for varying lengths of time, assured of finding

here a safe and comfortable base for operations in the most favorable regions. There has been a great deal of economic development in these countries since the days of Wallace and Beccari. Steamship lines now reach many points among these islands, and planters have established themselves in many places near the coasts, so that travelling is no longer either difficult or unsafe.

I would suggest that the first station be established in the very large but almost unknown island of Mindanao, the largest of the Philippines, and the interior of which has been rarely even visited by biologists. With an accompanying or succeeding station in British North Borneo, and later in Celebes and the more southern islands, it will be possible to make a more thorough study of island faunæ, as opened up by Wallace, than has ever before been possible in Malayan regions. Results of the highest importance are likely to follow both among plants and insects. A recent collection of Luzon Elateridæ sent by me to Fleutiaux, besides containing many endemic forms, has been shown to include many species formerly supposed to be confined to Borneo, Celebes, Amboina, and even Sumatra. More thorough and comprehensive work promises to completely revise our ideas of the distribution of certain groups through the Malayan Islands. Of even greater importance is the fact that beyond the few highly interesting observations of Wallace and some others, we know nothing of the life relations of the vast series of insects and plants inhabiting this region. This can be tapped effectively only by *residence*. My friend, Mr. Frederick Muir, expert entomologist, of Hawaii, now here with me, who has travelled widely in the Orient, concurs with me, in the belief that the proposed stations would be of the highest possible value in connection with the work in insect parasites which is playing so large a part in the economic entomology of to-day.

It would be necessary to fix some point or points in America as general depositories for the safe preservation and continued study of the materials gathered in connection with this

work. As an initial contribution, I would be glad to deposit now, under certain conditions, some 10,000 herbarium specimens, including cotypes of a large number of new species, and several hundred thousands of specimens of insects, including a large number of types as well as cotypes. Even this contribution alone it would be a pity for America to lose.

I can not, in the limits of a single letter, of this nature, present this matter in all of its more important phases. I believe that it merits your most active interest, and I hope that you will give it the most careful consideration, and then champion it, in so far as it may be possible or feasible for you. Especially, I wish that you would bring it to the attention of any others who would be likely to be interested in the matter, and also, where possible, bring it to the attention of museums, societies, or public institutions, which would be likely to consider taking an active interest in the promotion of this work. I believe that American biology greatly needs the assistance, the light, and the modifying influence that would result from active interest in one of the greatest and most important of the faunæ and floræ of the Orient.

C. F. BAKER

LOS BAÑOS, PHILIPPINES

THE PRESENTATION OF THE JOHN FRITZ MEDAL TO ELIHU THOMSON¹

It is a pleasure to take part in this tribute of respect to Professor Thomson not merely because of my association with him in the management of the affairs of the Massachusetts Institute of Technology, and the high personal regard that association with such a man entails, but because I realize that he is an educational force of great potency and that it is in the very highest interests of education that his merits should be widely appreciated and at least occasionally acclaimed. In view of what those who have preceded me have said, it must be unnecessary, especially to such an audience as this, to review in detail his remarkable career. All who know anything of

the subject know that in the field of electrical engineering his work has been most brilliant and that his contributions to the development of the great science on which so much of our modern conveniences depend will easily bear comparison with those of any man now living. To the public at large this will seem an exaggeration, but the public has little sense of values where such achievements as Professor Thomson's are concerned, and in this case it is handicapped in arriving at the truth through Mr. Thomson's deliberate unwillingness, I might perhaps say his utter incapacity, to advertise himself in the slightest degree.

Much nonsense has been spoken and written about the merits of national expositions, and amongst the statements that might fairly be placed in this class is one to the effect that it was the Paris Exposition of 1878 that *made* Thomson an inventor. It has been forces within Professor Thomson far more than forces outside that have contributed to his great success. He was twenty-five years of age at the time of the Paris Exposition and had already received a sound scientific training and earned distinction in his chosen field. Doubtless his visit to the Exposition stimulated his imagination and gave an incentive to his work, but it can hardly have made him an inventor. Be that as it may, it was not long thereafter that he became a marked man, through his notable contributions to science and its industrial applications. His earliest inventions comprised a comprehensive system for electric arc lighting and I have been told that in those pioneer days his arc-light dynamo was described by a German as "an American machine that violates every known law of the electrical art." This indicates how far Thomson was in advance of his day and on what insecure foundation the electrical art of the time was resting, for the same learned German had to admit that the machine was the most effective and successful dynamo on the market. This was only the beginning of a long series of triumphs that have led, it is said, to over five hundred patents, a large number of them embodying underlying principles so wide in their application that they might almost be classed

¹ Massachusetts Institute of Technology, December 8, 1916.